We claim:

1. A bit error rate tester comprising:

an optical multiplexer for multiplexing at least one test pattern data signal for injection into a device under test; and

an optical pulse source from which an optical pulse stream is provided to the optical multiplexer to be modulated with the at least one test pattern data signal multiplexed therein.

2. A bit error rate tester according to claim 1 further comprising an optical demultiplexer for demultiplexing a recovered data signal from the device under test.

3. A bit error rate tester according to claim 1 further comprising:

an optical converter adapted to convert an optical RZ signal having a data rate into an optical NRZ signal having the same data rate and an electrical NRZ signal having the same data rate,

wherein the optical RZ signal the converter is adapted to convert is an optical RZ signal produced by the optical multiplexer, and wherein the optical NRZ signal and the electrical NRZ signal are for injection into the device under test.

4. A bit error rate tester according to claim 2 further comprising:

an optical converter adapted to convert an optical RZ signal having a data rate into an optical NRZ signal having the

same data rate and an electrical NRZ signal having the same data rate,

wherein the optical RZ signal the optical converter is adapted to convert is an optical RZ signal produced by the optical multiplexer, and wherein the optical NRZ signal and the electrical NRZ signal are for injection into the device under test.

5. A bit error rate tester according to claim 2 further comprising:

an optical converter adapted to convert an optical NRZ signal having a data rate into an optical RZ signal having the same data rate,

wherein the optical NRZ signal the optical converter is adapted to convert is an optical NRZ recovered data signal from the device under test.

6. A bit error rate tester according to claim 3 wherein the optical converter comprises:

a PIN photodiode/transimpedance amplifier for converting an optical RZ signal into an electrical RZ signal;

a low pass filter and a limit amplifier for converting an electrical RZ signal into an electrical NRZ signal; and

an optical continuous wave source and an electro-absorption modulator for converting an electrical NRZ signal into an optical NRZ signal.

7. A bit error rate tester according to claim 4 wherein the optical converter comprises:

a PIN photodiode/transimpedance amplifier for converting an optical RZ signal into an electrical RZ signal;

a low pass filter and a limit amplifier for converting an electrical RZ signal into an electrical NRZ signal; and

an optical continuous wave source and an electro-absorption modulator for converting an electrical NRZ signal into an optical NRZ signal.

8. A bit error rate tester according to claim 5 wherein the optical converter comprises:

a PIN photodiode/transimpedance amplifier for converting an optical NRZ signal into an electrical NRZ signal; and

an optical pulse source synchronized with the electrical NRZ signal modulated by an electro-absorption modulator for converting the electrical NRZ signal into an optical RZ signal.

9. A bit error rate tester comprising:

an optical multiplexer for multiplexing at least one test pattern data signal for injection into a device under test;

an optical pulse source from which an optical pule stream is provided to the optical multiplexer to be modulated with the at least one test pattern data signal multiplexed therein;

an optical demultiplexer for demultiplexing a recovered data signal from the device under test;

a first optical converter adapted to convert a first optical RZ signal having a first data rate into a first optical NRZ signal having the first data rate and a first electrical NRZ signal having the first data rate, wherein the first optical RZ signal the first optical converter is adapted to convert is an optical RZ signal produced by the optical multiplexer, and wherein the first optical NRZ signal and the first electrical NRZ signal are for injection into the device under test; and

a second optical converter adapted to convert a second optical NRZ signal having a second data rate into a second optical RZ signal having the second data rate, wherein the second optical NRZ signal the second optical converter is adapted to convert is an optical NRZ recovered data signal from the device under test.

10. A bit error rate tester according to claim 9 wherein the first optical converter comprises a first PIN photodiode/transimpedance amplifier for converting the first optical RZ signal into an electrical RZ signal, a low pass filter and a limit amplifier for converting the electrical RZ signal into a second electrical NRZ signal, and an optical continuous wave source and a first electro-absorption modulator for converting the second electrical NRZ signal into the first optical NRZ signal, and wherein the second optical converter comprises a second PIN photodiode/transimpedance amplifier for converting the second optical NRZ signal into a third electrical NRZ signal, and an optical pulse source synchronized with the third electrical NRZ signal and a second electro-absorption modulator for converting the third electrical NRZ signal into the second optical RZ signal.

11. A method of bit error rate testing comprising:

optically multiplexing at least one test pattern data signal for injection into a device under test.

12. A method of bit error rate testing according to claim 11 further comprising:

optically demultiplexing a recovered data signal from the device under test.

13. A method of bit error rate testing according to claim 11 further comprising:

optically converting an optical RZ signal having a data rate into an optical NRZ signal having the same data rate and an electrical NRZ signal having the same data rate,

wherein the optical RZ signal is a multiplexed optical RZ signal, and wherein the optical NRZ signal and the electrical NRZ signal are for injection into the device under test.

14. A method of bit error rate testing according to claim 12 further comprising:

optically converting an optical RZ signal having a data rate into an optical NRZ signal having the same data rate and an electrical NRZ signal having the same data rate,

wherein the optical RZ signal is a multiplexed optical RZ signal, and wherein the optical NRZ signal and the electrical NRZ signal are for injection into the device under test.

15. A method of bit error rate testing according to claim 12 further comprising:

optically converting an optical NRZ signal having a data rate into an optical RZ signal having the same data rate,

wherein the optical NRZ signal is a multiplexed optical NRZ recovered data signal from the device under test.

16. A method of bit error rate testing according to claim 13 further comprising:

converting an optical RZ signal into an electrical RZ signal;

converting an electrical RZ signal into an electrical NRZ signal; and

converting an electrical NRZ signal into an optical NRZ signal.

17. A method of bit error rate testing according to claim 15 further comprising:

converting an optical NRZ signal into an electrical NRZ signal; and

converting an electrical NRZ signal into an optical RZ signal.

18. A method of bit error rate testing comprising:

optically multiplexing at least one test pattern data signal for injection into a device under test;

optically demultiplexing a recovered data signal from the device under test;

optically converting a first optical RZ signal having a first data rate into a first optical NRZ signal having the

first data rate and a first electrical NRZ signal having the first data rate, wherein the first optical RZ signal is a multiplexed optical RZ signal, and wherein the first optical NRZ signal and the first electrical NRZ signal are for injection into the device under test; and

optically converting a second optical NRZ signal having a second data rate into a second optical RZ signal having the second data rate, wherein the second optical NRZ signal is a multiplexed optical NRZ recovered data signal from the device under test.